Theory of first force

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Abstract

The effects of forces are well known; however, the basic mechanisms of how forces work and are transmitted remain unexplained. This essay is meant to determine these basic mechanisms.

Keywords: Theory of force

Modern physics is very capable of calculating the behavior of particles caused by forces; however, there is a lack of theory of how forces are generated and transmitted. To get an idea about the mechanisms of forces, I would like to exemplify a very important physics experiment, the diffraction of light by a double slit.

When light passes through a double slit and when the direction of each light quantum is not detected, a typical wave interference pattern appears behind the double slit. The light waves interfere with each other to build maxima and minima, which is the case even when only one light quantum at a time is sent through the experimental arrangement. As soon as one begins to detect the direction a light quantum takes through the double slit, the interference pattern disappears. Indeed, the very facts about what is being observed and where and when one observes it change its behavior! Clearly a kind of force is at work, since something is changing the possible whereabouts of the light quanta.

To simplify the basic mechanisms behind forces, assume a flat universe containing two points of existence with a “temperature” above zero such that these points will move around. Unobserved, the attribute “where” of these points in this universe remains a superposition of all the points' possible whereabouts. These points have the ability to observe each other in case they “collide.” When and if they do is randomly controlled through the probability of their presence and a second component I call “observation appetite,” a measure of how frequently the points try to look for a collision partner in all possible randomly chosen locations.

The random quasi-whereabouts of the points are determined and controlled by the probability of their presence in their locations. If these quasi-whereabouts are close enough to each other, a collision occurs and these whereabouts are fixed, causing the points' superpositions to collide;

otherwise, the whereabouts are discarded, keeping the points in their superposition.

If this scenario is started in two different places, the superposition of the two points increases in time around the points' initial positions. To keep matters simple, assume that the absolute area of the probability of presence grows at a certain speed around an initial position, creating a circle. Within its circle, each point has the same probability of presence everywhere. However, since there is no possible observer in the beginning, the points remain in superposition. In addition, it is possible for the two points' superpositions to start overlapping, as illustrated in Figure 1.

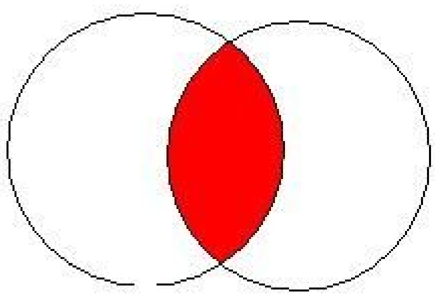

Figure 1.

From this point on, it is possible for the superpositions of both points to collapse and a new where in this flat universe to be defined as the momentary whereabouts of both points. This is the mechanism of what happens when these points collide in this universe. If and where such an observation, or collision, happens is dependent on the probability of presence of both points and their observation appetite.

Describing the probability of presence for a point implies that an observer always exists, but this is not the case. If there is no possible observer, a point in superposition will never drop out of its superposition. To determine a probability of presence for a place without a possible observer is therefore somewhat misleading.

If more points are placed in this two-dimensional space, the scenario starts to look like that shown in Figure 2.

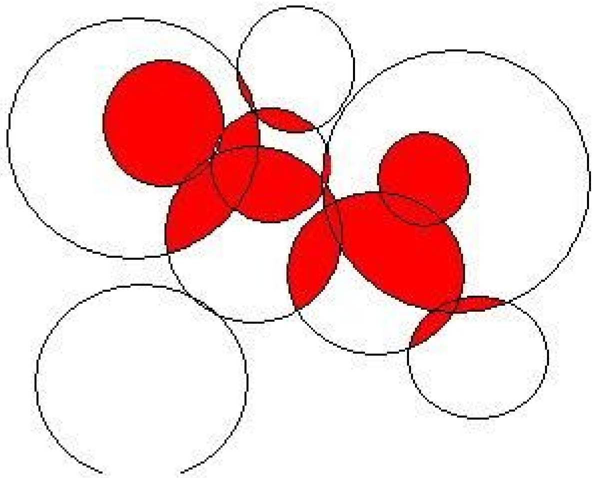

Figure 2.

Many different areas of probabilities of presence are growing, collapsing, and overlapping. Only within overlapping areas is a reciprocative observation, or collision, possible. Once such an observation of two points takes place, the superpositions of these points collapse, defining a new where, with the process starting over again from there. This simple mechanism between these points of existence leads to a certain affinity between them. A force between the points, a kind of first gravity, has been created.

If this flat universe is placed on the surface of a ball and its borders removed, the points will find a balance between this force and their tendency to spread around due to their temperature, that is, the speed of their movements. If the points are “cooled” by reducing their speed, their probability of presence grows about them while in superposition, such that they get closer together, or “denser,” in finding a new balance. Higher numbers of points in such a flat universe give rise to secondary and higher-order effects.

In sum, the very basic concepts of superposition and observation alone can create a force between an object and its observer simply because of statistical reasons. It is statistical pressure, or drag, that causes the effects interpreted as force.